

## ABSTRACT

The invention describes a method and apparatus for effectively communicating data along the acoustic channel of a subterranean well. The method comprises optimally driving an acoustic transmitter with an adaptive transmitter controller. A data signal is transmitted along the acoustic channel and detected as a distorted signal along the acoustic channel. The distorted signal is input to the adaptive transmitter controller which, based on the detected signal, modifies later transmissions to counteract the distorting effects of the transmitter and acoustic channel. The adaptive transmitter controller preferably comprises a neural network. Another receiver may be employed, at a point further from the transmitter, to receive the optimized signals.

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